**Chapter 2: The Functioning Cell**

**THE CELL MEMBRANE: GATEKEEPER OF THE CELL**

**The cell membrane regulates the passage of material into and out of the cell. It separates the non-living “outside” and the living “inside” the environment. The membrane is extremely important in allowing a cell to exist as a distinct entity.**

**This membrane is *selectively permeable* because it restricts passage to some substances, while allowing others to cross freely. Water diffuses across the membrane through pores that exist in the membrane.**

**DIFFUSION: Diffusion is the phenomenon whereby substances become evenly distributed or interspersed. A familiar example of diffusion is perfume. Diffusion is caused by the random movement of individual molecules. This movement results in the net movement of the molecules from a region where they are at a higher concentration to a region of lower concentration. Diffusion plays a large role in organisms. Some important biological substances can move freely in and out of cells. The direction of movement is determined by the concentration of the particles.**

**OSMOSIS: Osmosis is the diffusion of water through a selectively permeable membrane or partition. It results in a net movement of water from a solution that has a higher water concentration to one that has a lower water concentration. Water will move from a solution of lower solute concentration to one of higher solute concentration.**

**The movement of water is not affected by the kind of solute, but by how much of the solute is in the solution. Thus, if two solutions on either side of a membrane contain the same quantity of water, there will be no net movement of water.**

**When two solutions of unequal concentration are separated by a selectively permeable membrane, water movement by osmosis will tend to equalize the concentrations. Osmosis will continue until the movement of water is counterbalanced by the pressure of the force of gravity on the solution that is at a higher level.**

**HOW CELLS GET ENERGY**

**The energy we require is obtained from the food we eat, mainly from carbohydrates, which contain stored chemical energy in their bonds. The process that releases food energy is called cellular respiration. Cellular respiration occurs in two main stages:  *glycolysis* and *respiration*. Glycolysis is the initial breakdown of glucose, occurs in the cytoplasm of the cell, and does not require oxygen. Respiration occurs in the mitochondria and requires oxygen.**

**DEFINE: Copy and define the key terms found on page 64 of your textbook.**